

Claims

1. Catheter for the ablation of biological, in particular of animal or human, tissue, preferably for the ablation of human myocardial tissue, having at least one ablation or mapping electrode, characterized in that the at least one ablation or mapping electrode has a reduced number of electrical interference centres.

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2. Catheter according to Claim 1, characterized in that the electrical interference centres, which generate electric signals particularly during the output of high-frequency energy to the at least one ablation or mapping electrode, are essentially arranged on surface regions of the at least one ablation or mapping electrode, and are reduced in their number, areal extent and/or electrical effect.

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3. Catheter according to Claim 1 or 2, characterized in that the at least one ablation or mapping electrode has an electrolytically treated surface.

4. Catheter according to Claim 1, 2 or 3, characterized in that the at least one ablation or mapping electrode has an electrolytically treated surface which is treated with a solution containing halogen ions, in particular chlorine ions.

5. Catheter for the ablation of biological, in particular of animal or human, tissue, preferably for the ablation of human myocardial tissue, having at least one ablation or mapping electrode, in particular according to one of the preceding claims, characterized in that structures of the surface of the at least one ablation or mapping electrode have a rounded surface structure whose edges or tips preferably have a radius of curvature of more than approximately 500 nm, with

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particular preference of more than 100 nm, and most preferably of more than 10 nm.

6. Catheter according to one of the preceding claims,
5 characterized in that the at least one ablation or mapping electrode comprises a metal whose atoms are present at the surface in a fashion bound at least partially atomically or in an amorphous and essentially non-crystalline manner.

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7. Catheter according to one of the preceding claims, characterized in that at least one ablation or mapping electrode comprises platinum.

15 8. Catheter according to Claim 7, characterized in that the surface of the at least one ablation or mapping electrode is coated at least partially with elementary platinum.

Sub A 2
20 9. Catheter according to one of the preceding claims, characterized in that the surface of the at least one ablation or mapping electrode comprises regions with deposited metal present essentially in an amorphous manner or atomically.

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10. Method for producing a catheter with improved electrical properties, preferably a catheter in accordance with one of the preceding claims, in the case of which method the catheter comprises at least
30 one ablation or mapping electrode, characterized in that the ablation or mapping electrode, of the catheter, that is to be treated is immersed in a solution which contains ions whose motion can be influenced by an electrical field, and an electric
35 voltage is applied between the ablation or mapping electrode, of the catheter, that is to be treated and a further electrode in contact with the solution.

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11. Method according to Claim 10, characterized in that the further electrode is an electrode of the catheter.

5 12. Method according to Claim 10, characterized in that the further electrode is an external electrode.

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10 13. Method according to one of the preceding claims, characterized in that the solution contains halogen ions.

14. Method according to Claim 13, characterized in that the solution contains chlorine ions.

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15 15. Method according to one of the preceding claims, characterized in that the solution contains NaCl in a range from 0.1 to 100 g/l.

20 16. Method according to Claim 15, characterized in that the solution contains NaCl in an amount of approximately 7 g/l.

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25 17. Method according to one of the preceding claims, characterized in that the solution contains ions of a metal salt.

30 18. Method according to one of the preceding claims, characterized in that the applied voltage is an AC voltage.

19. Method according to Claim 18, characterized in that the applied AC voltage contains components which have a frequency of more than 0.01 Hz and less than 10 kHz.

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35 20. Method according to Claim 18 or 19, characterized in that the applied AC voltage contains components which are in a frequency range from 1 to 100 Hz, preferably at 10 Hz.

21. Method according to one of the preceding claims, characterized in that the applied AC voltage is in a range from 0.1 to 100 V_{eff} .

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22. Method according to Claim 20, characterized in that the applied AC voltage is in a range from 1 to 10 V_{eff} .

10 23. Method according to Claim 20, characterized in that the applied AC voltage is at 3 to 7 V_{eff} .

Sub A 7

15 24. Method according to one of Claims 10 to 17, characterized in that an AC current which generates a voltage having the properties set forth in Claims 18 to 23 is impressed on the ablation or mapping electrode and the further electrode.

20 25. Method according to Claim 24, characterized in that the AC voltage has, per ablation or mapping electrode, a current intensity of from 1 mA_{eff} to 1 A_{eff} , preferably from 30 to 100 mA_{eff} .

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25 26. Apparatus for catheter treatment, in particular for carrying out a method according to Claims 10 to 25, comprising a vessel for holding electrolytic solution and regions of the catheter as well as, during the conduct of the catheter treatment, an electrolytic solution, and a connection device for connecting at
30 least one ablation or mapping electrode of the catheter and a further electrode to a voltage-generating or current-generating unit, in the case of which apparatus the ablation or mapping electrode and the further electrode can be wetted by the electrolyte during the
35 conduct of the treatment.

27. Apparatus for catheter treatment according to Claim 26, in the case of which the voltage-generating

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or current-generating unit is an internal unit mechanically connected to the vessel.

28. Apparatus for catheter treatment according to
5 Claim 26, in the case of which the voltage-generating
or current-generating unit is an external unit not
mechanically connected to the vessel.

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10 29. Catheter for the ablation of biological, in
particular of animal or human, tissue, preferably for
the ablation of human myocardial tissue, having at
least one ablation or mapping electrode, characterized
by being produced or treated in accordance with a
method according to one of Claims 10 to 25.